AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 3. (Canceled)

4. (Previously Presented) A plasma etching apparatus comprising a vacuum processing chamber and a pair of parallel plate electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more,

wherein a gap between said electrodes is set to 60 mm or less and a plasma with a density of 5×10^{10} cm^{-3} to 5×10^{11} cm^{-3} is generated between said electrodes by applying a high-frequency electric power by use of a high-frequency power source between said electrodes, and

an ion energy controlling bias electric source is connected to said electrode being used also as the sample table, to use surface reaction between said pair of opposed electrodes effectively so as to obtain a high selective ratio of etching.

5. (Previously Presented) A plasma etching apparatus according to claim 4, wherein a means for setting an atmospheric pressure inside said vacuum processing chamber to 0.4 Pa to 4.0 Pa is provided.

6. (Previously Presented) A plasma processing apparatus comprising a vacuum processing chamber and a pair of electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,

wherein said plasma processing apparatus further comprises:

a gas introducing means for introducing an etching gas containing fluorine and carbon into said vacuum processing chamber;

a high-frequency power source to generate a plasma with a density of 5×10^{10} cm^{-3} to 5×10^{11} cm^{-3} between said pair of electrodes; and

a bias electric power source connected to said sample table to control energy of ions in said plasma.

7. (Previously Presented) A plasma processing apparatus comprising a vacuum processing chamber and a pair of electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,

wherein a gap between said pair of electrodes is set to 60 mm or less,

wherein said plasma processing apparatus further comprises:

a gas introducing means for introducing an etching gas containing fluorine and carbon into said vacuum processing chamber;

a high-frequency power source to apply a high-frequency electric power between said pair of electrodes so as to generate a plasma with a density of 5×10^{10} cm^{-3} to 5×10^{11} cm^{-3} between said electrodes; and

a bias electric power source connected to said sample table to control energy of ions in said plasma.

8. (New) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

an outer chamber connected with an evacuation means;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for generating plasma therebetween and providing the vacuum processing chamber;

an electrode cover comprised of silicon being provided at the outer surface of the upper electrode; and

a discharge confining means comprised of silicon for surrounding the vacuum processing chamber.

9. (New) The plasma processing apparatus according to claim 8; the lower electrode having a sample mounting surface; said apparatus further comprising a susceptive cover comprised of silicon near the sample mounting surface.

10. (New) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for providing the vacuum processing chamber therebetween;

a high frequency electric power source for supplying a high frequency energy for generating plasma between the upper electrode and the lower electrode;

a bias electric power source connected to the lower electrode to control energy of ions in the plasma;

an electrode cover comprised of silicon being provided at the outer surface of the upper electrode;

a susceptive cover comprised of silicon being provided near a sample mounting surface of the lower electrode; and

a discharge confining means comprised of silicon for surrounding the vacuum processing chamber;

wherein an inner surface of the vacuum processing chamber is substantially constituted by surfaces of silicon except for the sample mounting surface.

11. (New) The plasma processing apparatus according to claim 10, further comprising an outer chamber located outside of the vacuum processing chamber and connected with an evacuation means.

12. (New) The plasma processing apparatus according to claim 10, wherein the discharge confining means includes a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

13. (New) The plasma processing apparatus according to claim 8, wherein the discharge confining means is ring-shaped.

14. (New) The plasma processing apparatus according to claim 9, wherein the discharge confining means is ring-shaped.

15. (New) The plasma processing apparatus according to claim 10, wherein the discharge confining means is ring-shaped.

16. (New) The plasma processing apparatus according to claim 8, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

17. (New) The plasma processing apparatus according to claim 9, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

18. (New) The plasma processing apparatus according to claim 13, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.